How Livestock Grazing Affects Scaled Quail and Grassland Birds in West Texas

Historically, central North America was dominated by grasslands comprised of bluestems (*Andropogon* spp.), wheatgrass (*Agropyron* sp.), blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*). However, since the mid-1800s this region has seen more than an 80 percent loss in grassland habitat.

This decline has been attributed to urbanization, fire suppression, agricultural conversion and improper livestock grazing. While all of these factors have contributed to a loss in grassland habitat, improper grazing, both historically and currently, is a major concern, especially in the grasslands of the Chihuahuan Desert.

Spanning 362,000 km², the Chihuahuan Desert lies in southern Arizona and New Mexico, western Texas, and north/central Mexico. Major grassland declines have been caused by land conversion and improper livestock grazing in this region. Specifically, in the Marfa Grasslands of the Trans-Pecos region of Texas, historic overgrazing by livestock has caused an increase in shrub density, and therefore a decrease in grassland habitat for migratory birds and scaled quail (*Callipepla squamata*).

Less than 15 percent of the Chihuahuan Desert is grassland habitat, and only half of that is suitable habitat for grassland birds. Of the 37 grassland bird species monitored by the Breeding Bird Survey, 32 are declining. Of these species, 90 percent use the Chihuahuan Desert grasslands either during summer or winter. Both migratory and non-migratory birds are affected by shrub encroachment caused by overgrazing in the Marfa Grasslands and across the Chihuahuan Desert.

Researchers at the Borderlands Research Institute launched a research project to determine differences in scaled quail abundance and in diversity of grassland bird species between two grazing regimes on the Dixon Water Foundation’s Mimms Ranch in the Marfa Grasslands. The two grazing regimes studied were a continuously grazed pasture (873 ha) that had 30 cattle for 365 days/year, and 30 rotationally grazed pastures (averaging 105 ha) that had 180 cattle for 14 days/year.

To determine the difference in abundance of scaled quail, 72 call count surveys were conducted in 2017-2018. Each year, 18...
Call count surveys were performed in the continuously grazed pasture and 18 in the rotationally grazed pastures.

A total of 103 Scaled Quail were observed, 23 in the continuously grazed pasture, and 80 in the rotationally grazed pastures. In 2017, an average of 1.06 quail/survey were observed in the continuously grazed pasture compared to an average of three quail/survey in the rotationally grazed pastures. There was a similar pattern in 2018, with .22 quail/survey compared to 1.44 quail/survey in the continuously and rotationally grazed pastures, respectively.

In both years, researchers observed more quail in the pastures with the rotationally grazed system.

To assess diversity differences between grazing regimes, researchers conducted line transect surveys to identify bird species in each portion of the ranch. Transects were conducted in both the winter and summer to survey migratory birds. A total of 192 line transect surveys were conducted in 2017-2018. Almost 3,000 birds belonging to 43 different species were observed along transect lines.

Species richness and two diversity indices (Simpson’s Diversity Index and Shannon-Wiener Index) were calculated for each season. Overall, the rotationally grazed pastures had higher species richness and higher values for both indices, indicating a more diverse assemblage of bird species in the rotationally grazed pastures compared to the continuously grazed pastures.

Results from this study show that, per hectare, there is a higher number of scaled quail in the rotationally grazed pastures than in the continuously grazed pasture. This pattern is similar when looking at diversity and species richness, showing greater diversity in the rotationally grazed pastures. These results indicate that a rotational grazing system may allow for a more diverse assemblage of migratory grassland bird species as well as a higher abundance of Scaled Quail, regardless of season or year. A rotational grazing system allows for the recovery of plant species while providing enough grazing pressure to help control shrub encroachment and growth and produce some bare ground that is important for scaled quail.

Overall, this study suggests that a rotational grazing system provides healthy habitat for Scaled Quail and migratory grassland birds. This habitat can be achieved and maintained by using a high intensity-short duration grazing regime, which prompts plant diversity while controlling shrub encroachment. Results will allow researchers and managers to use a combination of stocking rate and grazing strategy to better manage for Scaled Quail and grassland bird habitat.